

BAD METAL BEHAVIOR IN MOTT SYSTEMS

PROGRAM

SP/CE

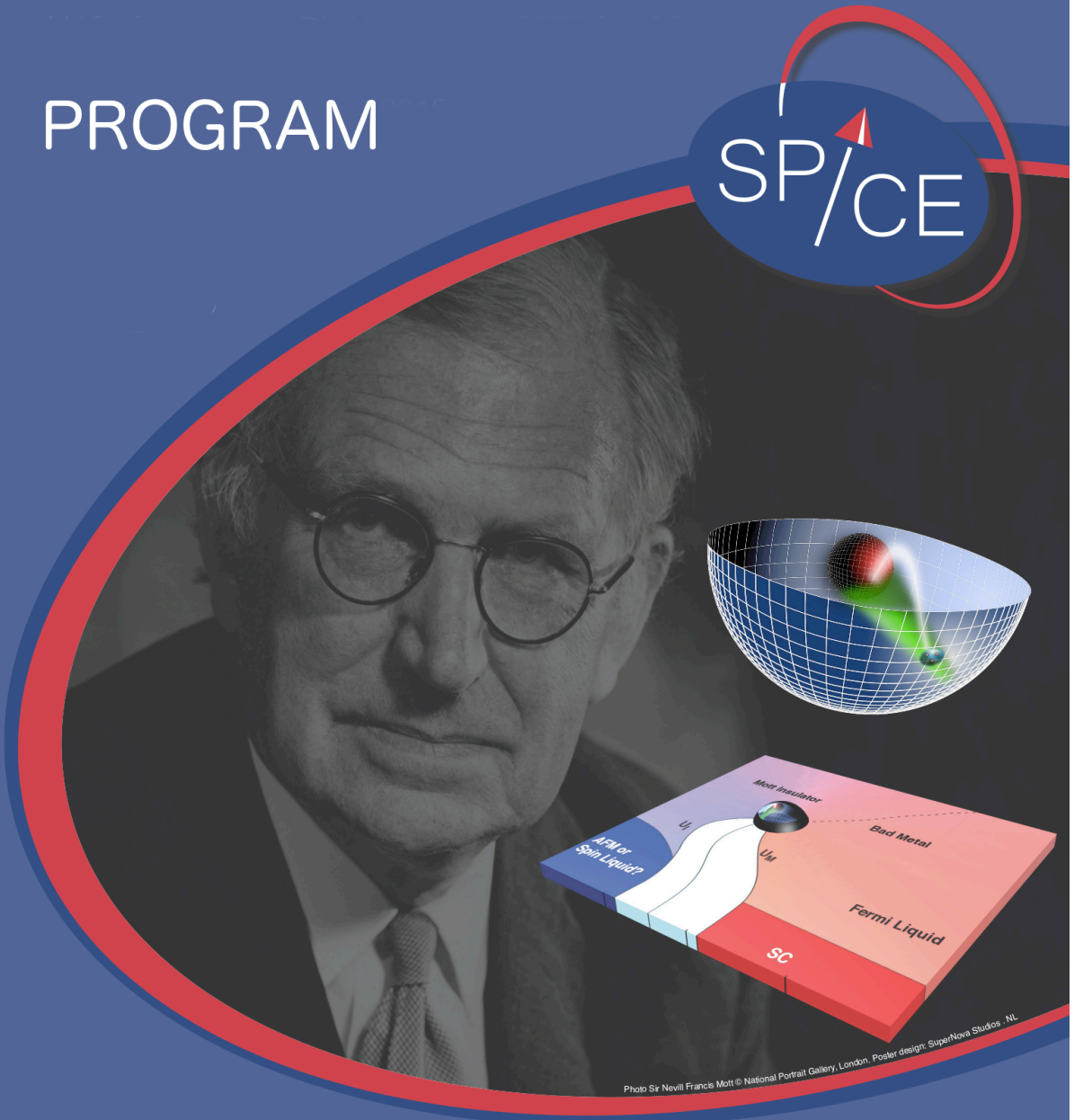


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SCOPE:

Research in “Bad-metal” phenomena merges different theoretical and experimental areas ranging from spin-fluctuation and dynamical mean field theories, to holographic duality from string theory, to emerging Motttronics and adaptive electronics. This workshop brings together speakers covering the most recent exciting developments. Its format merges specialized and overview talks, with a strong emphasis in interdisciplinary interaction.

The Spin Phenomena Interdisciplinary Center aims to bring together scientists from diverse disciplines and of varying seniority in the broad area of spin related research. Its goal is to break down scientific barriers and foster emergent areas of research that combine the strengths of different fields.

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SPIN
PHENOMENA

INTERDISCIPLINARY CENTER

Bad Metal Behavior in Mott Systems 29 June-02 July 2015



Location: Sparkassenakademie Schloß Waldthausen,
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Program

Monday 29 June

MORNING SESSION

Mott transition

09:00-09:10 *Jairo Sinova, University of Mainz - Introduction to meeting – open questions, opportunities, SPICE*

09:20-10:50 *Nigel Hussey (tutorial), Radboud University - Universality of bad metallic transport in correlated systems*

11:00-11:10 *Coffee Break*

11:20-11:50 *Vladimir Dobrosavljevic (talk), Florida State University - Bad Metal Behavior and Mott Quantum Criticality*

12:00-12:30 *Todadri Senthil (talk), Massachusetts Institute of Technology - Continuous Mott transitions and related phenomena*

12:40-13:50 *Lunch at Schloß Waldthausen Restaurant*

AFTERNOON SESSION

Mott transition

14:00-14:30 *Simone Fratini (talk), Institut Néel - Wigner-Mott transition and charge frustration in layered triangular lattices*

14:40-15:10 *Jernej Mravlje (talk), Jozef Stefan Institute - Thermopower and entropy in multi-orbital bad-metals: lessons from Sr₂RuO₄*

15:20-15:40 *Coffee Break*

Iron pnictides

15:50-16:20 *Luca de' Medici (talk), European Synchrotron Radiation Facility - A review of recent experimental evidences of orbital-selective Mott physics in Iron Superconductors*

16:30-17:00 *Jörg Schmalian (talk), Karlsruhe Institute of Technology - Coherence-Incoherence crossover in iron based systems*

17:10-17:30 *Coffee Break*

Heterostructures

17:40-18:10 *Susanne Stemmer (talk), University of California - Santa Barbara - Quantum Criticality, Non-Fermi Liquids, and Bad Metals in Complex Oxide Heterostructures*

18:20-18:50 *Ivan Schuller (talk), University of California-San Diego - Metal-Insulator transition in simple oxides and their heterostructures*

19:00-20:00 *Dinner at Schloß Waldthausen (buffet)*

Tuesday 30 June

MORNING SESSION

Mott organics

- 09:00-09:30** *Kazushi Kanoda (talk), University of Tokyo - Quantum critical transport and emergence of a spin liquid near Mott and Mott-Anderson transitions*
- 09:40-10:10** *Martin Dressel (talk), University of Stuttgart - Unconventional charge dynamics in low-dimensional organic conductors*
- 10:20-10:40** *Coffee Break*
- 10:50-11:20** *Pierre Monceau (talk), Institut Néel - Charge ordering in low dimensional organic compounds*
- 11:30-12:00** *Louk Rademaker (talk), University of California - Santa Barbara - Glassy dynamics in geometrically frustrated Coulomb liquids without disorder*
- 12:10-13:30** *Lunch at Schloß Waldthausen Restaurant*

AFTERNOON SESSION

13:40-15:00 *2min Poster previews*

15:10-15:20 *Coffee Break*

Holography

- 15:30-17:00** *Jan Zaanen (tutorial), Leiden University - Holographic Duality and Condensed Matter Physics*
- 17:10-17:30** *Coffee Break*
- 17:40-18:10** *Philip Phillips (talk), University of Illinois - Optical Conductivity as a Window into Mottness and Scale Invariance in the Cuprates*
- 18:20-18:50** *Takashi Oka (talk), University of Tokyo - Many-body strong field physics: From Mott insulators to holographic QCD*
- 19:00-20:00** *Dinner at Schloß Waldthausen (buffet)*

Wednesday 01 July

MORNING SESSION

Field effects

- 9:00-10:10** *Jianting Ye (tutorial), University of Groningen - Field Effect Control of Quantum Phases Using Ionic Gating*
- 10:20-10:50** *Isao Inoue (talk), National Institute of Advanced Industrial Science and Technology - Enormous electrostatic carrier doping of SrTiO₃: negative capacitance?*

11:00-11:10 *Coffee Break*

11:20-11:50 **Marc Gabay (talk)**, *Université Paris-Sud - Spin Polarized State in the Two-Dimensional Electron Liquid at the Surface of SrTiO₃*

12:00-12:30 **Masaki Oshikawa (talk)**, *University of Tokyo - Instability in magnetic materials with dynamical axion field*

12:40-13:30 *Lunch at Schloß Waldthausen Restaurant*

AFTERNOON SESSION

13:40-15:10 *Posters*

Synapse & Neurons

15:20-16:30 **Marcelo Rozenberg (talk)**: *Université Paris-Sud - Universal dielectric breakdown and synaptic behavior in Mott insulators*

Bad metals

16:40-17:10 **D.D. Sarma (talk)**, *Indian Institute of Science - The curious case of NiS: Is it a metal or is it not!*

17:20-17:30 *Coffee Break*

17:40-18:10 **Eduardo Miranda (talk)**, *State University of Campinas - Disorder effects in Mott systems*

Mott transition

18:20-18:50 **Tomo Takayama (talk)**, *Max-Planck-Institute Stuttgart - Exotic electronic states produced by strong spin-orbit coupling in complex Ir oxides*

19:00-20:00 *Dinner at Schloß Waldthausen (buffet)*

Thursday 02 July

MORNING SESSION

Synapse & Neurons

9:00-10:10 **H.-S. Philip Wong (tutorial)**, *Stanford University - Nanoscale Electronic Synapses for Brain-Inspired Computing*

10:20-10:40 *Coffee Break*

10:50-11:20 **Hermann Kohlstedt (talk)**, *University of Kiel, CAU Kiel - Niobium-oxide and Vanadium-oxide as unconventional materials for applications in neuromorphic devices and circuits*

11:30-12:00 **Yuriy Pershin (talk)**, *University of South Carolina - Neuromorphic and Unconventional Computing with Memory Circuit Elements*

12:10-13:30 *Lunch at Schloß Waldthausen Restaurant*

AFTERNOON SESSION

Synapse & Neurons

13:40-14:10 *Doo Seok Jeong (talk), Korea Institute of Science and Technology - Leaky integrate-and-fire neuron circuit realized by Pearson-Anson oscillation and its noise*

14:20-14:50 *Jinfeng Kang (talk), Peking University - Design and Optimization of TMO-ReRAM Based Synaptic Devices*

15:00-15:10 *Coffee Break*

Cuprates

15:20-15:50 *Neven Barisic (talk), Vienna University of Technology - Evidence for good metal behavior in normal state of the cuprate high-temperature superconductors*

16:00-16:30 *Dragana Popovic (talk), Florida State University - Superconductor-insulator transitions in highly underdoped cuprates*

16:40-16:50 *Coffee Break*

17:00-17:30 *Marcello Civelli (talk), Université Paris Sud - Pseudogap to the extreme*

17:40-18:00 *Jairo Sinova, University of Mainz - Conclusions*

19:00-20:00 *Dinner at Schloß Waldthausen (buffet)*

Poster titles:

Nonlinear bond-operator theory and 1/d expansion for coupled-dimer magnets,
Darshan G. Joshi

Unstable Domain-Wall Solution in the Metal-Mott Insulator Coexisting Regime,
Tsung-Han Lee

Nematic order and partially symmetry breaking,
Ke Liu

Upper critical field of ionic gated MoS₂,
Jianming Lu

Pseudogaps in SrTiO₃ Quantum Wells,
Patrick Marshall

Pairing induced superconductivity in holography,
Balazs Meszner

Kinetic Monte-Carlo simulation of memristive resistance-switching devices,
Thomas Mussenbrock

Turbulent strings in AdS/CFT,
Keiju Murata

Study of spin-orbit effects in the Mott-Hubbard metal-insulator transition,
Oscar Andres Najera Ocampo

Quantum Nematics and gauge theory,
Jaakko Nissinen

Non-equilibrium, steady state, multi-orbital IPT solver,
Milos Radonjic

Investigating transient localization of charge carriers in organic semiconductors using optical spectroscopy,
Andrea Rohwer

Electromagnetic instability in holographic QCD,
Akihiko Sonoda

Tc corrections within AG slave boson theory,
Shao Tang

Transport and NMR studies of Mott transition in the X-ray irradiated organic conductor $k\text{-(ET)}_2\text{Cu}[\text{N}(\text{CN})_2]\text{Cl}$,
Mizuki Urai

Mott quantum criticality and bad metal behavior,
Jaksa Vucicevic

Double Perovskite Thin Layer with Spin-Orbit Coupling,
Masahiko Yamada

Emulation of neuronal functionality by using a VO₂-based oscillator circuit,
Martin Ziegler

A quasilocal strange metal at the onset of charge density wave order,
Liu Jun Zou